

[*Note*.—The Secretary takes this opportunity to correct an error in the report of the case of hydrophobia related by Dr. Cabot (*Extracts from the Records*, vol. ii. p. 47, *Am. Journ. Med. Sci.* April, 1854, p. 359). Dr. C. E. Ware is stated to have “inquired if there were any well-authenticated instances of recovery from the bite of a rabid animal?” Dr. Ware’s question was: if there were such instances of recovery from *declared and positive hydrophobia*.]

ART. VII.—*Case of Paraplegia, caused by Concussion of the Spine. With Remarks.* By CHARLES A. LEE, M. D.

ACCIDENTS to the spinal cord may be considered, in the light of physiological experiments, throwing much light on its office and functions. Many such have been recorded. The case I am about to detail, has sufficient points of interest, perhaps, to render it worthy of permanent record.

In the spring of 1853, I was called to see Mr. Pope, of South Sodus, N. Y., a patient of Dr. Lewis Graves, from whom I learned the following particulars: Age 57, habits intemperate, health not very good for a short time previous to the injury. On the 28th of August, 1848, he fell from his wagon, striking his head and shoulders on the ground, the whole weight coming upon his head, which was thrown backward and under the body. On raising him up, he was found to be helpless, but wholly conscious. Dr. Graves found him, two hours afterwards, sitting upon the floor, a friend supporting him in an erect position. The arms and lower extremities were found wholly paralyzed, sensation and motion entirely destroyed; the knees were inclined to fall together, and were not easily separated; the hands were flexed upon the wrist; the thumbs and fingers turned in upon the palms of the hands; though he was unable to raise his hands to his head, he had some power to raise the arm and shoulders. On examination, there was found to be a partial dislocation of the sixth cervical vertebra, it being thrown partly to the left of the spinal column. The patient complained of tenderness on pressing over the parts injured. The urine had to be drawn off by a catheter for several days, after which the urine and feces passed involuntarily, though he was conscious when it was about to happen. The quantity of urine secreted was about the same as in health. The bowels were kept open for several weeks by catheters. The pulse was about fifty in a minute, and quite feeble; appetite generally good, and the food digested well for about four years. Since that time, the appetite has been poor, and digestion considerably impaired. Vomiting would often come on soon after eating; the feet and legs became anasarcaous, and abdominal dropsy was also present. This condition existed for several years. There was sloughing of the cellular tissue of the nates and posterior part of the thighs, caused by pressure from sitting on a hard chair. About six months after the injury, he fell into the hands of a Thomsonian, and was treated by lobelia, emetics, and cathartics, during which, inflammation of the scrotum and penis took place, resulting in extensive sloughing of the parts. Dr. Graves, on being again called in, administered stimulants and tonics, under the influence of which the recuperative powers again rallied, and in the course

of two months the parts were healed. Since that time (1849), sores have occasionally appeared on those parts subjected to pressure, as from sitting or lying. The sense of feeling returned in some degree, about ten months after the injury, and gradually improved, while the power of motion was not improved. The treatment consisted chiefly in supporting the general strength by tonics, and suitable diet.

April 9, 1854. Present condition of patient: Sensation has returned, but the power of motion remains the same, being totally lost. The limbs are emaciated; both the flexor and extensor muscles of the hand and forearm are contracted, and have been permanently so since the injury. The surface is cold; pulse feeble, and ninety in a minute. Copious perspiration is excited by the least exertion. The patient is quite weak and feeble; is unable to sit up much; appetite poor; quantity of urine secreted unusually large, and discharged involuntarily; much pain in the back and limbs; is very restless, and sleeps but little. The bowels are moved once in forty-eight hours. Can move the shoulders and body by using great exertion. Several sores on the thighs and hips difficult to heal. Slight cough; tongue thickly furred and flabby; digestion very poor, and the power of the system gradually failing. The mind has remained all the time unimpaired, though occasionally feverish and irritable.

The following letter from Dr. Graves will complete the history of the case:—

“DEAR SIR: I take the liberty of giving you a statement of the case of Mr. P., since my communication of April 9, last. The patient was then feeble, and the powers of life seemed failing pretty rapidly. He continued to fail from that time. Food and drink were ejected from the stomach without much effort, and soon after being swallowed. He complained of no nausea or sickness at the stomach, nor of any distress; still, food and drinks were not retained for about three weeks previous to his death. He was very much emaciated. Sloughing of the thighs had taken place, also the inside of the knees, by the contraction of the muscles, thus bringing them closely and permanently in contact. There was also involuntary twitching of the muscles of the legs, causing considerable motion and pain. The patient was very restless, requiring the attendants to turn and change his position frequently. The urine and feces were discharged involuntarily, as usual; respiration was short; pulseless at the wrist for several days before dissolution. The carotids beat feebly. The surface cold, and covered with a clammy sweat. Mind continued clear and undisturbed until death, which occurred on the 8th of May.

“*Autopsy.*—In the presence of Drs. Pearce, Peck, Mann, Trachout, and Reynolds, I made a *post-mortem* examination of the parts supposed to have been injured on the 8th. I carefully removed the five cervical and first dorsal vertebræ, and then laid them open longitudinally, so as to expose the spinal cord. The spinous process of the fourth, fifth, and sixth vertebræ were slightly depressed; the spinal cord was found to be firm and healthy from the second to the fifth vertebræ; within this last there was much softening and depression, the cord having the appearance of having been *bruised* or *cut off*. Below this point the coil was softened, and evidently shrunken or atrophied, with evidences of inflammation and engorgement of the bloodvessels. The conclusion, from all the appearances, was, that, at the time of the accident, a partial dislocation of the fourth, fifth, and sixth vertebræ had taken place, with depression of the spinous process, causing a *fracture* and *entire separation of the cord*, and giving rise to all the subsequent phenomena. I send you the specimen to examine for yourself, after which I would like to hear your views in regard to the case, and particularly with regard to the question how have the lower extremities been supplied with vitality, since the injury?”

Truly yours, &c., LEWIS GRAVES, M. D.

SOUTH SODUS, May 13, 1854.”

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Remarks.—On examining the specimen, I find that there is no evidence of there having been any *fracture* of the body of the vertebræ, although the spinous process of the second and third cervical appeared to be *carious*. On opening the thecæ of the cord, which was greatly atrophied, the spinal marrow was found softened and disorganized, while the dura and pia mater were slightly thickened, vascular, and closely adherent to the walls of the vertebral canal. Whether the spinal cord was entirely destroyed within the fifth or sixth vertebra, as stated by Dr. Graves, I could not certainly determine, as it was difficult to ascertain the extent of the degeneration of the nervous into fatty matter, though it was extensive.

Such a condition would be hardly consistent with the existence of sensation, which we have seen was restored, to some extent, during the latter years of life.

The case is an interesting one on many accounts; ramollissement and atrophy of the cord existed through the whole extent of the cervical vertebræ, while the caliber of the vertebral canal was in no point so much diminished as to interfere with the functions of the cord. Was it, originally, a case of concussion only, resulting in congestion and inflammation, and subsequent softening, or was it a case of fracture, the marks of which had disappeared? The latter can hardly be supposed possible; while there are cases on record which go to support the former conjecture. Abercrombie relates a case, where a man received a severe shock, by falling some ten feet and striking his back upon a pile of stones. *He was immediately paralyzed in the lower extremities*, and the urine and feces were passed involuntarily. The power of sensation remained, but at the end of a month, when admitted into the hospital, there remained complete loss of motion, and all the muscles of the affected parts were atrophied, and in a state of great flaccidity. There was deep-seated pain on pressure, in the region of the third, fourth, and fifth dorsal vertebræ; evacuations involuntary, breathing slow, appetite moderate, digestion good, mind quite entire, and pulse and other functions natural. He died about five weeks after the accident; trismus, convulsions, and tetanus having come on forty-eight hours previous to death. *Autopsy* disclosed no injury to any of the bones of the spine. The pia mater of the cord was highly vascular, especially at the upper part of the dorsal region; and there was extensive ramollissement of the body of the cord, chiefly in its anterior columns, and to such a degree, that in some places they were entirely diffuent. This extended to the upper part of the cord, and affected the corpora pyramidalia.

In the case, whose history has been given by Dr. Graves, it is, of course, impossible to determine how long the disorganization of the cord had existed, although there is good reason to believe that it commenced soon after the injury was received. The patient survived for nearly six years, after such a degree of injury, as to prevent, in a great measure, the influence of volition upon the lower extremities, or the transmission of sensation from them to the brain; and the usual phenomena were manifested, which are generally, if not

universally, present under such circumstances, viz: sloughing, slower repair and reproduction of parts, owing to impaired nutrition, involuntary twitchings, and lessened capacity of maintaining itself against the influence of external forces, involuntary twistings, &c. In this case also was strikingly exhibited what we so often find in atrophy and ramollissement of the brain, the breaking up of the nerve-fibres, and the production of abundant granule-cells or masses, and free-floating granules, similar to those commonly found in the granular or fatty degeneration of various cells of both normal and morbid origin, and called by Paget, "liquefactive degeneration."

Since the above was written, Dr. Graves, in reply to some queries addressed to him, has communicated the following particulars:—

"1. The portion of the cord, where it seemed to be bruised or cut, was between the fifth and sixth cervical vertebræ. When first examined, it was very distinctly felt by passing the finger from above downwards on the cord. There was a feeling, at the point mentioned, as though the cord had been cut off, and below this point the cord was found softened and diminished in size.

"2. His urine was ammoniacal and turbid.

"3. His bowels did not move involuntarily at all times. Cathartics acted kindly when given. The discharges were thin and watery.

"4. His mental faculties remained clear to the last, as in health. He had no tetanic spasms. There was pain on pressure over the injured part of the spine.

"5. His speech was slightly affected; voice weak, and had to exert himself to speak loud. There were but slight motions of the limbs, except involuntary twitchings.

"6. He had more power over the upper than the lower extremities.

"7. There was occasional vomiting, and at last both food and drink were rejected as soon as swallowed.

"8. At times he could not sleep, and two or three weeks before his death he became very restless, and slept but little; position had to be often changed.

"9. The sloughing upon the thighs was about four inches in diameter, and on the inside of the knees, about the size of a dollar, caused by their being drawn together; also a large spot on the back, where it came in contact with the chair-back.

"10. Medicines did not affect him as much as when in health; larger doses were required.

"11. There were no prominent contractions of the toes or of the fingers."

The above case requires no extended comments, as a careful examination detects no luxation or fracture—no diminution of the spinal canal; it furnishes an interesting example of lesion of function from violent concussion of the spinal cord; or, it is possible that, from the violent twisting and bending of the cervical vertebræ, the cord may have sustained serious injury, independent of luxation or fracture. It is generally supposed that, in cases of permanent paralysis of the inferior extremities, it must arise from one of the latter; this case, however, goes to prove that it may occur independent of such injury.

If we are to believe, as Dr. Graves states, that the spinal cord was cut and twisted off between the fifth and sixth cervical vertebræ, then we must con-

clude, as maintained by Todd and Bowman, that "the spinal cord shares, in some degree, in the functions of sensation and voluntary motion." These writers remark that "the recent discovery of the *amphioxus lanceolatus*, a small fish found in the Archipelago, makes it highly probable that voluntary motion and sensation may exist where there is a well-developed spinal cord, the anterior extremity of which tapers to a fine point, and is far from exhibiting the ordinary characteristics even of a brain so inferior in organization as that of fishes."¹

Here there was a partial restoration of sensation and motion, with such a physical condition of the cord as would seem entirely inconsistent with the existence of such functions, viz: ramollissement, atrophy, and degeneration; and, according to Dr. Graves, an entire twisting off, or disappearance of the nervous matter of the cord, between the fifth and sixth vertebræ.

ART. VIII.—*Operation for Laceration of the Perineum.* By F. M. ROBERTSON, M. D., Lecturer on Obstetrics in the Charleston Summer Medical Institute. [With a wood-cut.]

IT is not my design to enter into a discussion of the manner in which this accident may occur, or to compare the merits of the various operative procedures proposed and advocated by different surgeons and obstetricians for the purpose of relief. In alluding to the slight reference to the accident by various writers on obstetrics, Fahnestock remarks:—

"This silence on so important a subject can only be ascribed to the general impression, that the accident is one of very rare occurrence. It may be, in the practice of judicious practitioners, for Dr. Dewees informed the writer, a few years since, that he had to contend with but one case, happening to himself, in his extensive practice, which he attributed to the patient attention he always bestowed on supporting the perineum during the expulsion of the child through the os externum; yet, such is the nature of things that, in some cases, with the best management, laceration of the perineum is unavoidable."—*Am. Journ. Med. Sciences*, N. S. vol. i. p. 99.

The author just quoted states that only one case of laceration occurred, under his management, in a practice of eighteen years. In a practice extending over a period—from 1829 to 1854—of twenty-five years, the accident has never occurred in any case, of either natural or instrumental labour, under the management of the writer.

During the past summer I was consulted in relation to a lady, aged about twenty-four years, who, I was informed, had suffered from this melancholy accident, while in labour with her first child, about a year since. She was attended by a midwife, and the occurrence was attributed to some mismanage-

¹ The Physiological Anatomy and Physiology of Man, Am. ed. p. 276.